A

PRACTICAL TREATISE

ON THE

CULTURE OF THE VINE,

AS WELL UNDER GLASS AS IN THE OPEN AIR.

BY

JOHN SANDERS.

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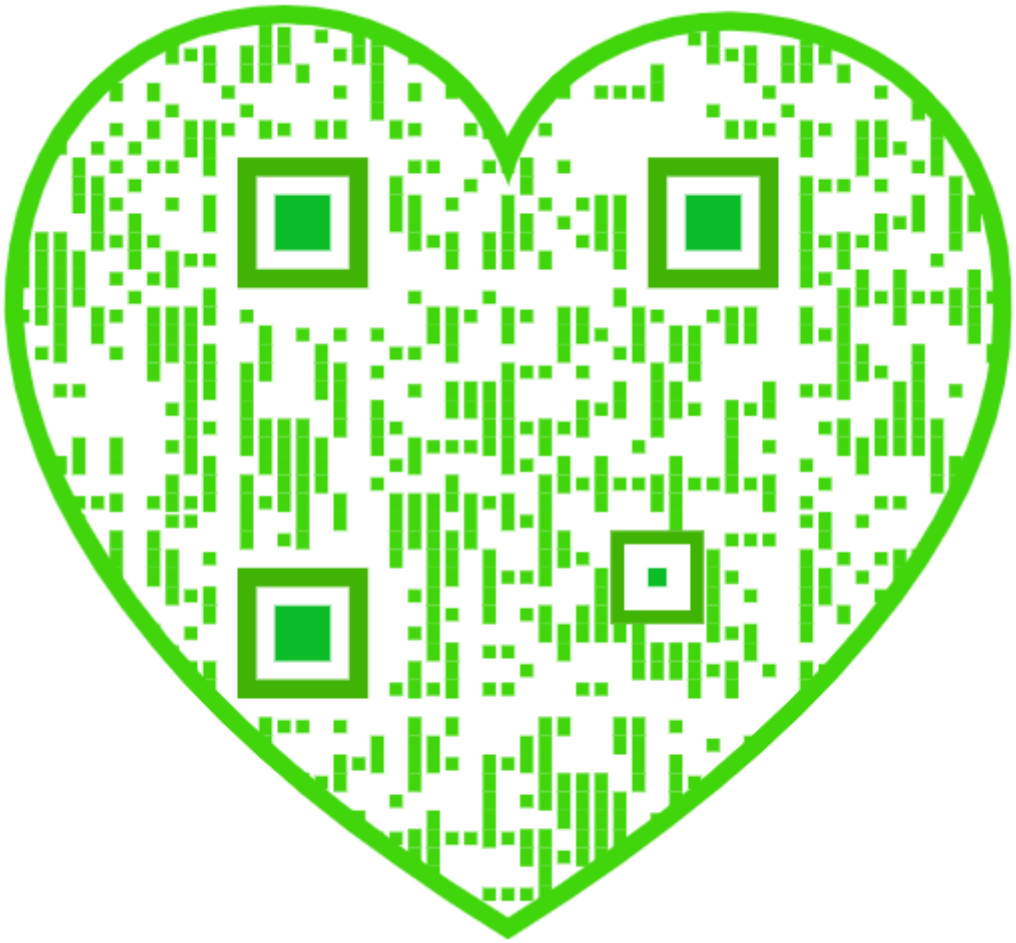

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DESCRIPTION OF PLATES.

PLATES I., II., III., and IV,

PLAN OF DOUBLE-FRONTED WALL HOUSE FOR GRAPES AND OTHER PURPOSES AS EXPLAINED IN CHAPTER I.

PLATE I.

EXTERIOR END SECTION.

a. Pillar.
b b. Front lights.
c. Wrought-iron tie bar.
d. Hollow space for vine-stems.
e. Door-way.
f. Gutter to carry off the rain-water.

PLATE II.

FRONT ELEVATION.

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Plate III.

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c c c. Pathway.
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d. Shelf for plants.
e. Small pillar for support of the above shelf.
f f. Hot-water pipes.
g. Pit wherein to grow various plants.
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i. Front path.
k. Gutter to carry off rain-water,
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PLATES V. and VI.

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b b. Cavity formed with bricks and laths for drainage.
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e e. Shelves for growing a succession of young vines.
f. Pit for propagating or growing various plants.
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h h. Wire to which the vines are trained.
i. Back path.
k k. Steps leading from back to front path.
l. Front path.
m. Gutter.

PLATE IX.

GROUND PLAN.

a a. Troughs.
b b. Laths.
c c. Open cavity for water to pass off.
d. Back path.
e. Front path.
f. Pit for propagating or growing various plants.
g g. Steps.

Plate I.

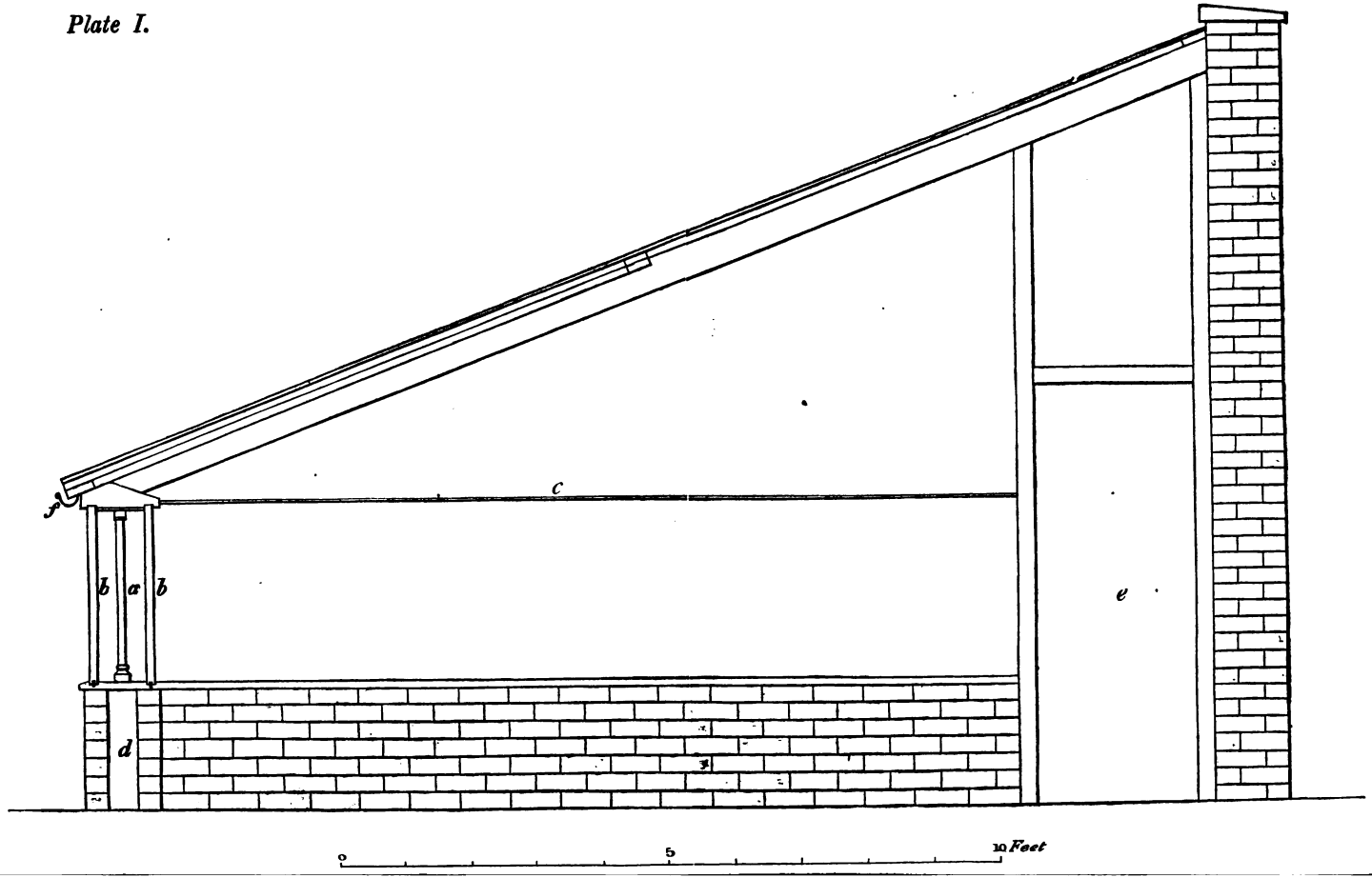
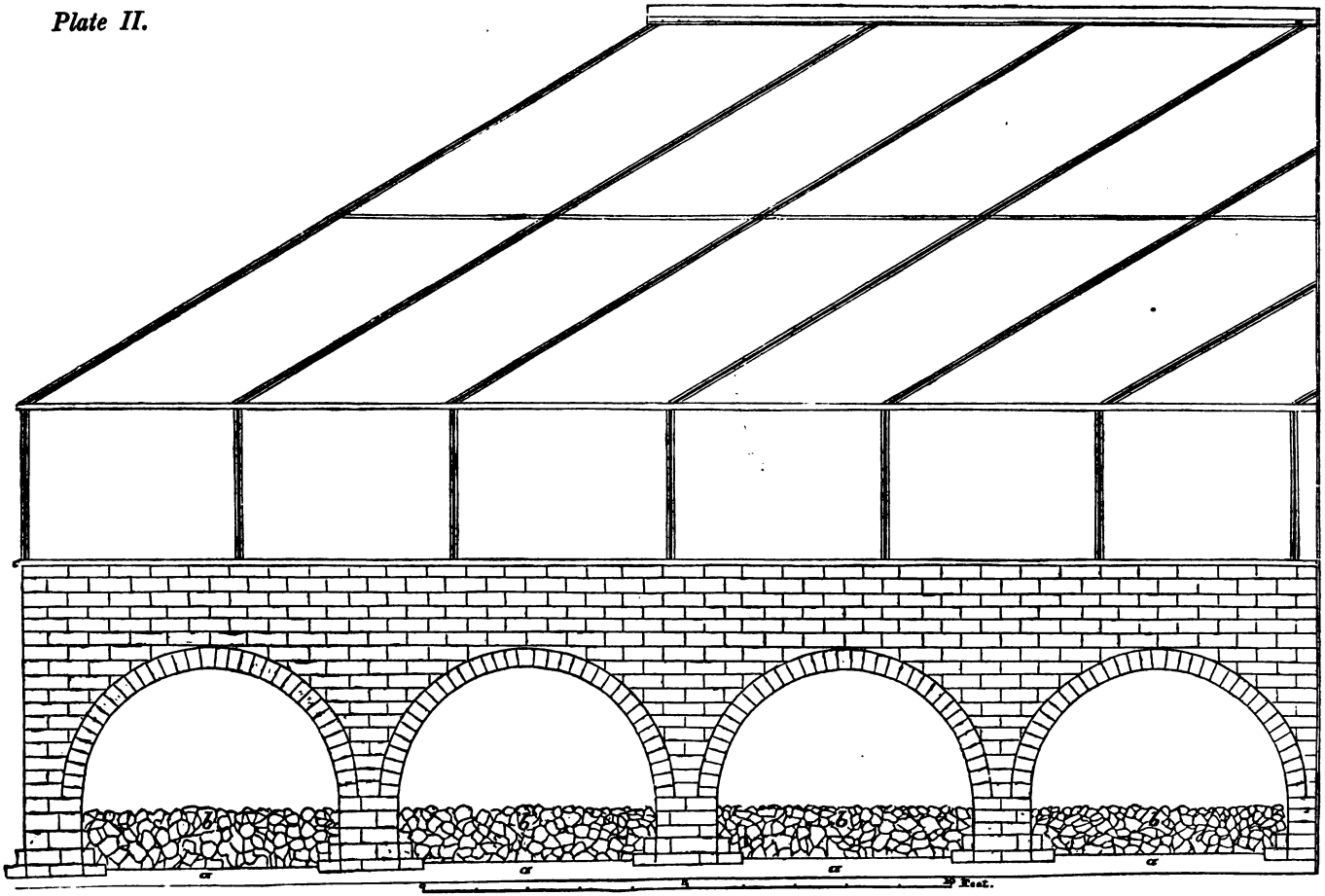


Plate II.



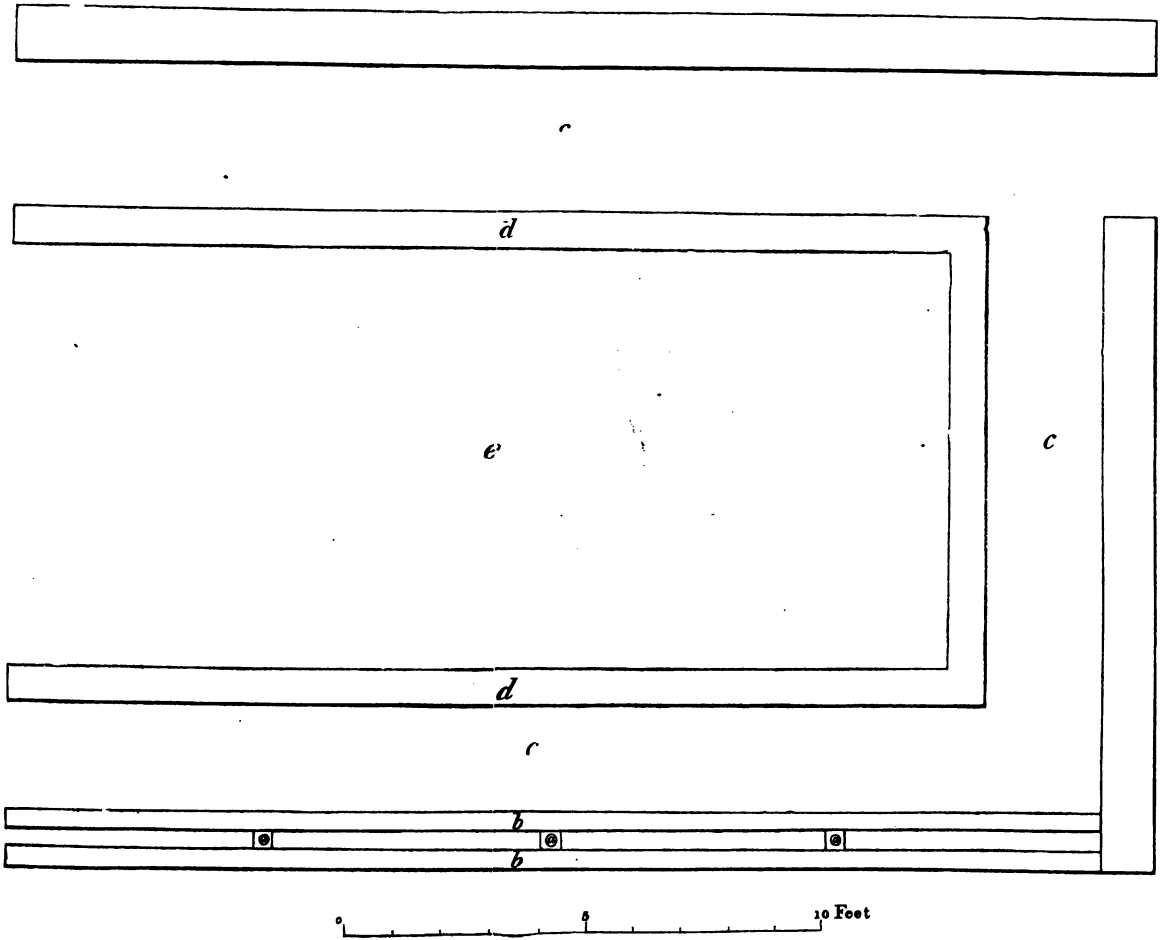

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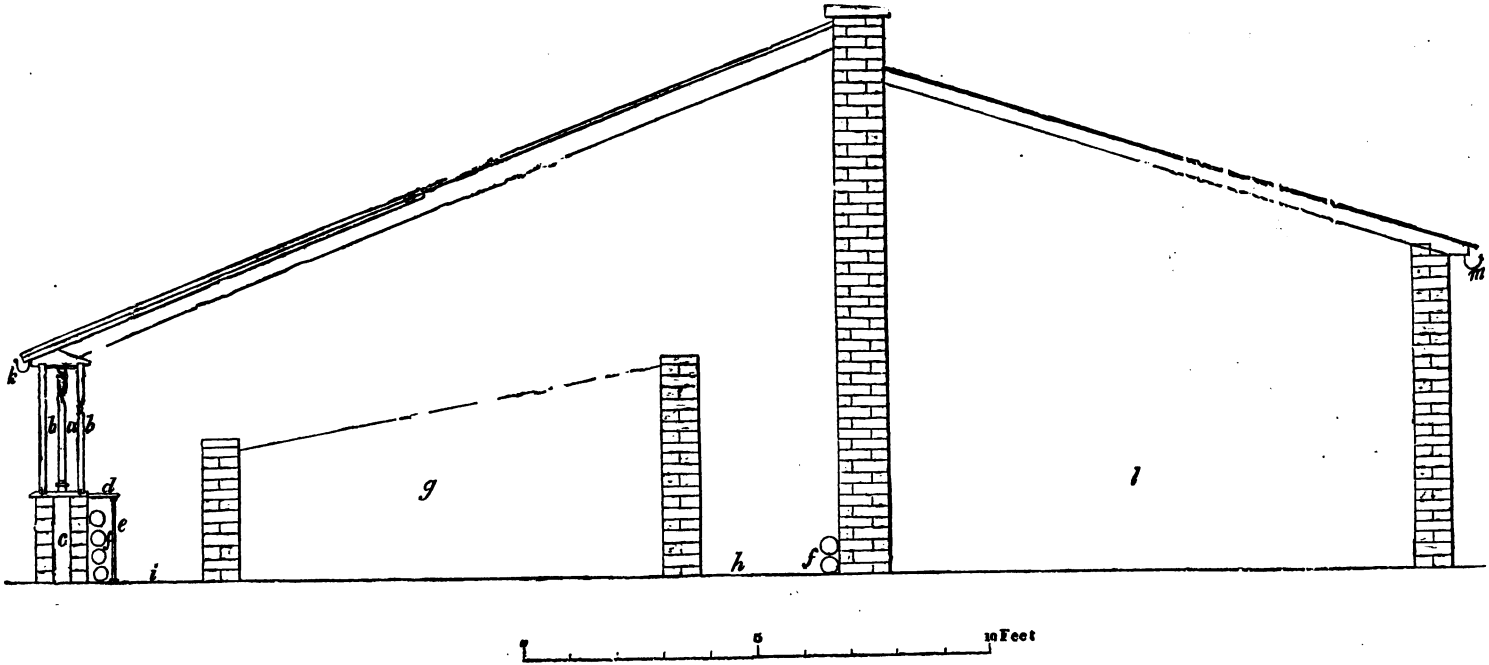
Plate IV.



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INTRODUCTION.

Nullam, Vare, sacra vite prius severis arborem.
HOR. *Ode.* xviii.

THE early history of the vine is involved in obscurity. Many people consider its native country to be Syria; but this appears exceedingly doubtful. It has been supposed that the vine was trained and reared by the hand of man almost immediately after the subsiding of the great waters of the deluge, as we find recorded in the 9th chapter of Genesis, that "Noah began to be an husbandman, and planted a vineyard."

The early cultivation of the vine in Egypt is proved by the paintings on the ancient tombs. We have no account of its introduction into Greece, where it evidently flourished before the time of Homer; and it is supposed to have been introduced somewhat later into Italy, and spread from thence through the north of Europe, and into Great Britain, as the venerable Bede, writing in 731, makes mention of several vineyards. At that period they were generally attached to monastic institutions; subsequently, however, the

monks and the vineyards, in a great measure, disappeared together. After a time the grape-vine again made its appearance, and might be seen not only about the abodes of the rich, but gracing many a cottage home in the southern provinces of England, affording a source of emolument as well as of pleasure. But, though much cultivated, it is rare that Grapes are found to ripen properly in the open air, in our high latitude and clouded skies. The forcing system of cultivating grapes, by means of artificial heat, was then resorted to, and, when properly managed, fruit the most delicious in all the world may be thus procured. The author of the following pages has no intention, even if he had the ability, of adding one to the many elaborate treatises written upon this subject. His desire is only to lay down general, comprehensive, and practical rules, which he has worked out and tested for himself, and to which he would fain draw the attention of others. A few simple plans, also the result of experience, which he trusts will be found generally useful to others, are here offered to their notice. All conventional terms, and words familiar alone to the horticulturist, are studiously avoided; and the advice of Cobbett has been attended to, namely, that, in teaching any science, we should avoid using scientific expressions beyond the understanding of the unlearned, and endeavour to teach our readers from what they do already know that which they do *not* know.

A

TREATISE

ON THE

CULTURE OF THE VINE.

CHAPTER I.

CULTURE OF THE VINE UNDER GLASS.

In selecting a site for a vinery, choose a southern aspect, and as elevated a spot as convenient. It is most desirable that it should be so situated, as it ensures many advantages by standing on high ground. It not only commands more light, air, and sun, all of which are of the most vital importance, but it also escapes much of that pernicious damp which always settles on the lower ground, acting most prejudicially on the health and purity of the spot; and, in consequence, the borders, in low situations, frequently become both sour and sodden, from the difficulty there is in obtaining a sufficient declivity to carry off the superabundant moisture. I would, therefore, always recommend that, in building a house for grapes, it should occupy a spot sufficiently elevated to prevent the necessity of digging deeply. The advantages to be gained by carrying out these suggestions must, I think, be sufficiently obvious to recommend themselves; for in very many cases houses of long standing occupy low situations, and therefore, in order

to secure a proper declivity to carry off all superfluous wet, a very considerable excavation must necessarily be made, or the border can never be properly drained.

Having said thus much relative to the situation, I now proceed to the erection of the grape-house; and as every grape-grower is fully aware of the difficulty in protecting the stems of vines, planted in outside borders, from the frost during the progress of early forcing (and even at a later period of the spring they often receive injury from the same cause), I have presented a plan for a vinery, which I feel assured will not only remedy that evil, but will also possess other advantages, which will be better explained as I proceed.

The house should be placed on arches, with a double wall upon them, extending along the front of the building (as shown in the Plate), and a space or cavity of five inches to be allowed between the walls, with a plating along the top of each, and a groove to receive the upright lights, thus making them to slide, instead of opening with hinges. It may be argued, that this plan of erection would not only be more expensive, but that the double walls would present a heavy, unsightly appearance. In reply to this, I hope to prove that the great convenience and utility secured thereby will more than counterbalance any little disadvantages, more particularly as, I think, the heavy appearance would be much less increased by the plan than may on first view of the subject be imagined; as, for instance, a single wall would of necessity require to be nine inches thick, whereas in this case each one would be four inches, thus the increase of width would only be the five inches of space left between the two walls, and any deficiency of strength could be amply supplied by wood or brick ties. It may, perhaps, be unnecessary to say more, as all other particulars are fully pointed out in the building plan. I will, therefore, proceed with my next subject, viz., the border. This should be at least sixteen feet in width, three-and-a-half in depth, including drainage, &c. And, first, the higher side of it which abuts the

vinery should, when the border is entirely finished, be exactly on a level with the interior flooring; and that being the criterion as to the height, the necessary calculations for the depth required to render it so must be made before the foundation of the border is commenced, and the ground should be prepared accordingly, always remembering to preserve from the beginning the proper declivity, not less than eighteen inches from the house to the front of the border, and to have the surface of the ground quite smooth before laying the foundation over it, which must be done as follows:—Spread concrete to the depth of four inches, and when sufficiently hard, upon that put eight inches of brickbats; and next form a drain, extending along the front edge of the border, to receive and carry off all superfluous moisture. Having completed this portion of the process, place two layers of sods, each to be about fourteen inches long, one foot wide, and six or seven inches thick; cut from pasture which has been lying undisturbed for some years, and which ought to be of a fibrous, rich, loamy substance; not too retentive of moisture, but yet of that adhesive nature termed "strong loam." The great recommendation is for the soil to contain much of the fibrous matter, for the twofold reason, that it prevents the soil from becoming sodden, as well as giving nourishment to the vine-roots, as the grass and other vegetable matters decay. It is not, however, possible at all times to follow out this rule, as every locality has its own peculiar soil, varying in density and colour; therefore much must be left to the judgment of the cultivator. Arrange each sod with the grass-side downwards, for the hollow spaces formed between the layers, as well as assisting the drainage, will prove beneficial to the roots. The remaining depth of the border should be filled up with the following compost:—two parts of rough turfy loam, similar in quality to the sods placed below, and cut in pieces two or three inches square; one part of well-decomposed farmyard manure, and the remaining fourth part composed of equal quantities of droppings from the sheep-

fold and leaf-mould; let all be well mixed together, adding a little sand if the loam be deficient of it. Choose a dry time for preparing the whole, as much depends on its being well mixed in good working order. When it is thus prepared, suffer this mixture to lie in a heap for a month or two before using it, and let it be occasionally turned, so that it may become thoroughly amalgamated. It will be necessary to give it some shelter from the drenching rain, either in an open shed, or other convenient protection, not excluding it from the action of the air.

In spreading the border with the sods, and also with the above compost, great care must be taken to avoid trampling it, which can be done by laying a plank down for the workman's footsteps. By so doing the sods will be preserved in their rough unbroken state, which is most desirable; and the whole border will settle gradually of itself, and the surface will be smooth and even. In preparing this compost, take care to have plenty, so that there may be a reserve in case of casualties; you are thus certain of having precisely the same mixture, if it should be required, which will be preferable in all respects to a strange compost being added. The border, when entirely completed, should remain undisturbed a week or ten days, and in the course of that time it will, doubtless, settle down more or less; and if it be found to have sunk below the desired level, it can easily be raised with a little of the superabundant compost.

As the health and fruitfulness of all vegetable productions mainly depend on the state of the roots, it must be evident that no crop can arrive at perfection unless they be in good order; consequently it will at once be seen how necessary it must be to supply them with whatever is most congenial to them. Now, as scarcely any two sorts of fruit-trees thrive equally well in one and the same compost, I am (in order to make the necessary distinction) the more particular in endeavouring to point out, as clearly as I can, the method and soil which I have, in the course of my experience, found to answer best for the growth of grapes; and having completed these directions for making

the border, it may be as well, before proceeding with the planting, to offer a few general remarks on the different kinds of grapes most worthy of cultivation.

Amongst the best varieties grown there is, perhaps, none that excels the Black Hamburgh for general hot-house purposes, the quality and flavour of which is so universally known and approved that it would be superfluous to say much on the subject. There are also many other kinds well worth cultivation; amongst them the Frontignac, West's St. Peter's, Black Prince, and Sweet Water; all of which thrive equally well under one and the same treatment, which is not the case with the Muscats. I will, therefore, refer to these latter hereafter, and proceed at once with the above named sorts, which are procurable at any nursery, ready for planting, at a moderate expense. And here I would recommend that the selection be always made from those grown from eyes instead of layers, as the former, in their growth, are found to be more close-jointed, and also to produce finer fruit than the latter. In the course of the subject, I hope to be able clearly to demonstrate the advantages derivable from the double walls.

In planting the vines (the best period for which is in the autumn), I would recommend their being placed two feet apart, or as nearly so as may be practicable; but the distance must, in some degree, be regulated by the underground arches, for the following reason—that the stems of the vines are intended to be introduced through them, and to be carried up between the two walls, thus affording them that protection from the effects of frost, which is so desirable during the progress of forcing; and if each vine, when planted, is sufficiently long to reach the top of the front sash, so much the better. In training them, let the first be brought immediately under the rafter, and the next under the centre of the light; and so on throughout. It is quite necessary that the wires, under the roof, to which they are to be tied in the course of their growth, should be at least sixteen inches from the glass. I know they are commonly

placed much closer to it, but the consequences arising from the practice are highly injurious to the vines. It matters not what sort of glass may be used, for the same objection exists to a closer proximity, as the leaves in their growth soon come into immediate contact with it, and are consequently scorched, and the evils produced thereby will soon become obvious and multiplied. In the first place, the injury thus inflicted checks the sap, and prevents it performing its proper functions; secondly, every injured part not only harbours insects, but very frequently engenders red spider and thrip, whereas, when the vines are trained at the distance before named, a free circulation of air passes between them and the glass, preserving the foliage in a healthy and vigorous state, and in every way assisting nature in the performance of her mysterious duty.

Towards the end of March or the beginning of April the sap will, without artificial heat, begin to circulate through the newly-planted vines, and the buds will then of course be immediately put forth, all of which must be removed with the exception of the two leading ones, and the safest mode of doing it is by pressure between the finger and thumb, as the use of the knife would, at this early stage, cause them to bleed. When the two reserved buds have broken, and grown a foot or rather more in length, cut off the weakest, thus leaving only one shoot to each vine. And here it may be as well to remark, for the information of the learner, that this shoot will in due time become a part of the bearing-stem; consequently, as it progresses, great attention must be paid to tie it in regularly and carefully, and every precaution must be taken to prevent its being bruised or broken, either by handling it roughly, or tying it too tightly. In the latter case, be sure to give plenty of room for expansion. The matting used for the purpose should never be drawn tight, as, by doing so, if the brittle shoot is not broken by it, the circulation of the sap will be obstructed, which is an evil to be carefully avoided. When the shoot is grown long enough to reach the top of the house,

it will be necessary to stop its further progress by pinching it off, and, provided it is in as vigorous a state as it ought to be at this period, it will very shortly throw out a lateral branch at the bud nearest the extreme end, where it has so recently been stopped, which lateral branch must be allowed to grow until it has attained the length of twelve or fourteen inches; then it should be stopped, by taking a joint off at the point, as recommended in the case of the principal shoot. It may be necessary to inform the uninitiated of the object of this process. I will, therefore, endeavour to explain it.

The crop of the next season entirely depends upon the buds along the rod remaining in a quiescent state, and the only means of keeping them so is the encouragement given to the sap to flow freely to the part to which the lateral branches or buds are proceeding, and thus preventing the buds from being prematurely excited. There will also be either a direct or lateral shoot thrown out from the base of these important buds, but they must not on any account be permitted to make much increase; and, in order to prevent it, stop them beyond the first joint, and this must be repeatedly done if their growth should render it necessary: and the same rule must be observed with the lateral shoots at the end of the vine also.

In proceeding with the culture of the young vines, only moderate heat, merely acting as a little assistance to nature, will be required. Therefore, a temperature not exceeding sixty degrees during the night, and ranging from seventy to eighty degrees in the day, will be sufficient during the whole period of their growth. At this time, the frequent use of the syringe in the evenings will be very beneficial. Take care, however, to admit air early in the mornings, in order to allow any excess of moisture to escape, and also to prevent the tender foliage being scorched by the rays of the sun.

In order to encourage the free rooting of the vines, let the border be occasionally forked over, to the depth of an inch or two. Be most cautious, however, in doing it, to avoid

disturbing the young fibres; and, as the work is proceeded with, give a good supply of water from a pot with a rose, provided the border is dry. Be particular, likewise, as you go on, not to trample on the portion fresh watered, as it is desirable that the soil on the surface should be hollow, to give access both to sun and air.

Many persons entertain an opinion that the border may, without detriment to the vines, be laid under some light crop, but I am perfectly convinced that such a plan is the very worst economy that can be practised, for even a bed of flowers would be sufficient to exclude from the roots below the action of the air and sun, which are necessary to their well-doing.

When the leaves have acquired the faded appearance of a forest tree in November, and the wood is perfectly hard and ripe, then, and not till then, is the proper time to give them rest by exposure. At this time the vines should be pruned, and, in doing so, it is the practice of many persons to cut the young rods down to within a bud or two of the original stem, thus deferring the time of bearing for another year, with a view of invigorating and establishing the vines; but I am perfectly convinced and prepared to say from experience, that, provided the foregoing instructions for the treatment of them up to this period have been fully and carefully observed, they will be in a fit state to carry out a good crop the next season. My own system of pruning is as follows:—Shorten the young rods two feet from the top downwards. By doing this, the vines, in the next forcing, will have room to shoot forth and bear their fruit without coming in contact with the top or back of the house. The side lateral shoots should also be cut off to within half an inch of the bud from the base of which they proceed. When this is done, the next thing will be to arrange them for their season of rest, or wintering; a period of six weeks, at least, should be allowed for the purpose, and as much longer as possible.

And now I hope to be able to prove the second advantage given by the double walls. The only thing required is to slide

out the upright sashes from the outer wall, which must be done from the end of the house, then disengage the vines from the wires to which they have been trained, and dispose of them by securing them to the pillars, or any other convenient plan which may suggest itself. This can be readily done without the vines undergoing that twisting and distortion so liable to bruise and injure them when taking them out of houses, as they are usually built. In the present case all that difficulty is removed, without any danger of checking a free circulation of the sap; and when the vines are thus disposed of, and the front sashes slid into the groove of the inner wall, the house is not only enclosed and in a fit state to apply to any other purpose, but the top lights, by projecting over the outer wall, will be a great advantage to the dormant vines by the protection thus afforded them from heavy rains, and also preventing icicles from hanging about them, whereby, according to my belief, they receive more injury than from any other cause. A free circulation of dry and cold air is highly beneficial to them; at the same time, a protection from too much moisture is necessary, and, by adopting the above plan, they will have the advantage of both.

Having thus arranged the vines for their season of rest, it may not be here out of place to enlarge a little on the different purposes to which the vacant house may in the meantime be applied; for instance, where early vegetables are required, such as French beans, cucumbers, or perhaps strawberries, you are thus afforded every facility of producing them. The same facility is afforded with flowers; a supply of roses, pinks, lilacs, &c., can easily be had: in short, the advantages to be gained by judicious management of the unoccupied vinery will be considerable, and it will, I think, be admitted that they prove more than equivalent to the trifling additional expense of the building. The period at which the grapes are required to be ripe must be the guide as to the time of taking the dormant vines again into the house, for the purpose of

commencing forcing them. Always bear in mind that five clear months must be allowed to bring the fruit to maturity. Therefore, supposing the grapes are required for consumption on the 1st of July, forcing must, of course, be commenced on the 1st of February; and the first thing to be done with the vines will be to wash the rods with the following mixture, viz.:—To three quarts of rain-water add two ounces of soft-soap, four ounces of sulphur, and two ounces of tobacco; boil all well together for half an hour, and when cold it is fit for use. After applying this wash to the vines, replace the upright sashes on the outer wall, and carefully train the vines on the wires as heretofore. Much diversity of opinion exists as to the best method of protecting the border during the period of forcing, and almost endless are the opinions entertained, and methods adopted, to carry out the desired object. After much observation, added to practical experience on many different plans, I have found the following to answer best:—Before any internal heat is applied to the vines, proceed with the border as follows. Leaves of hard-wooded forest-trees, such as oak, beech, &c., which have been previously collected in a large heap and well trampled together, will soon become heated, and settle into solid masses. In using these leaves, take from the centre of the heap those that are the driest and most firmly cemented together, and in as large pieces as possible, and from four to six inches thick. Begin by forking the surface of the border lightly over, and when the earth is thus loosened, the masses of leaves should be laid entirely over the border, lapping one over the other, on the same principle as the roof of a house is slated, for the purpose of preventing the rain penetrating. Over the solid pieces of leaves add six inches of dry loose ones, and on the top of them one or two inches of fine mould, to prevent the wind from blowing the leaves about, as well as to give a clean and neat appearance. The temperature for the first fortnight or three weeks, during the night, should not exceed from fifty to fifty-five degrees, allowing an

increase of ten degrees throughout the day. Syringe freely with tepid water until the buds are excited; then cease syringing altogether, but still keep a moist atmosphere by throwing plenty of water on the paths. At this stage increase the heat five or seven degrees; admit air upon every available occasion, but at the same time give it in moderation, as a sudden admission of cold air is as injurious as an excess of heat, both of which must be carefully guarded against. When the young shoots have grown to the length of about two inches, you will then be able to ascertain with certainty those showing the best bunches, which, of course, the grower will select, as far as it is practicable. In leaving the required supply, do so at as regular distances along the rod as possible, leaving certainly not more than twelve or thirteen shoots, as shown in the following illustration:—

When the proper selection is made, cut away all the other shoots close to the rod with a sharp knife, in order to enable the wounds to heal over quickly, which will then present a neat appearance, as well as allow an unchecked and free circulation of the sap, and also prevent any future outbreak of shoots. It may not be amiss here to remark, that I consider what we call the "Spur" system of pruning decidedly the best, and for this reason, that by following that method, no more wood is grown than is absolutely necessary for the well-doing of the present crop of fruit, and at the same time for ensuring the desired quantity for the following year, and that of the best description; whereas, by growing a fresh supply of rods annually, the quality of the present crop is not only materially deteriorated, but, by the growth of the new rods the house becomes crowded, and in consequence that free

circulation of air, so essential to the grape in all stages, is considerably lessened from the superabundance of foliage intercepting to a great extent both light and air. Another advantage also arises from the spur system. The double demand made upon the vine, by bearing its fruit for the present season and feeding young rods for the following, at one and the same time, greatly accelerates its exhaustion and decay, both of which are obviated by the plan I venture to recommend.

Having thus digressed, I will now proceed with directions for carrying out the present crop to perfection. When the young shoots are sufficiently advanced, stop each, leaving one joint, or eye, above the fruit, and one bunch to each branch. When the bunches are in flower, keep the house somewhat closer, with a humid atmosphere, giving air, of course, if the temperature ranges higher than seventy-six degrees. Much is gained by very early thinning: it is desirable to commence almost as soon as the berries are set. By so doing, you prevent the bunches from becoming crowded, and thus avoid doing injury to the remaining berries, by a touch either from the fingers or scissors, as it is most desirable, even at this early stage, to preserve the bloom entire, and plenty of space must be allowed between each berry, so as to give room for expansion. Clip out all the smallest and inside berries; but much must be left to the discretion of the grower as regards the extent of thinning, as it would be difficult to give any specified rule to act upon.

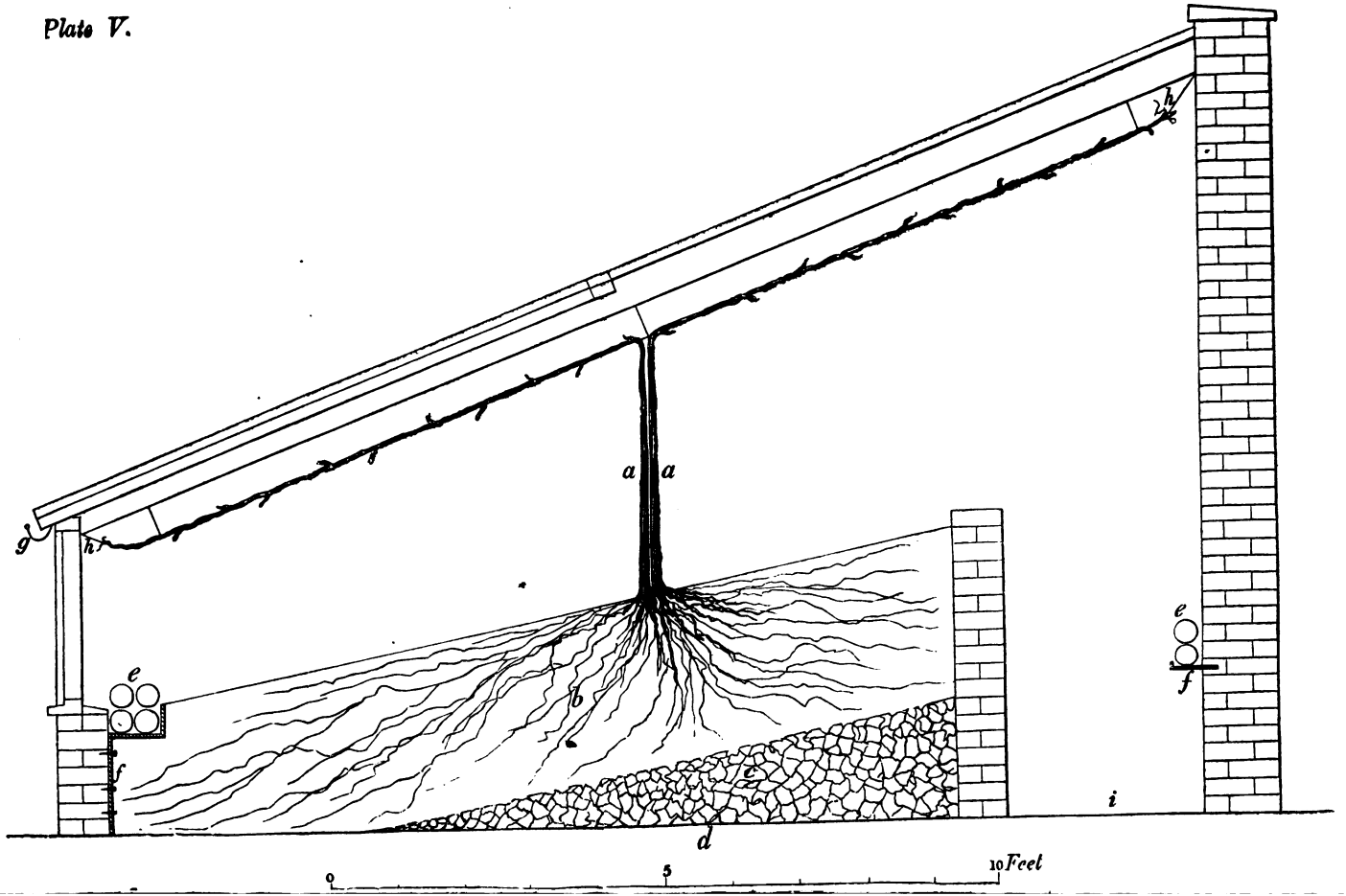
Great vigilance must be observed in removing the lateral shoots as they appear, in order to throw all the strength of the vine into the growing fruit, and also to prevent the overcrowding and darkening of the house; due care must be taken in admitting air freely, giving a little as early in the morning as is consistent with safety; attending strictly to the cleanliness of the house, always keeping it in a pure and healthy state; and, if so done, little danger may be apprehended from the injurious effects of red spider; but if, from hard forcing,

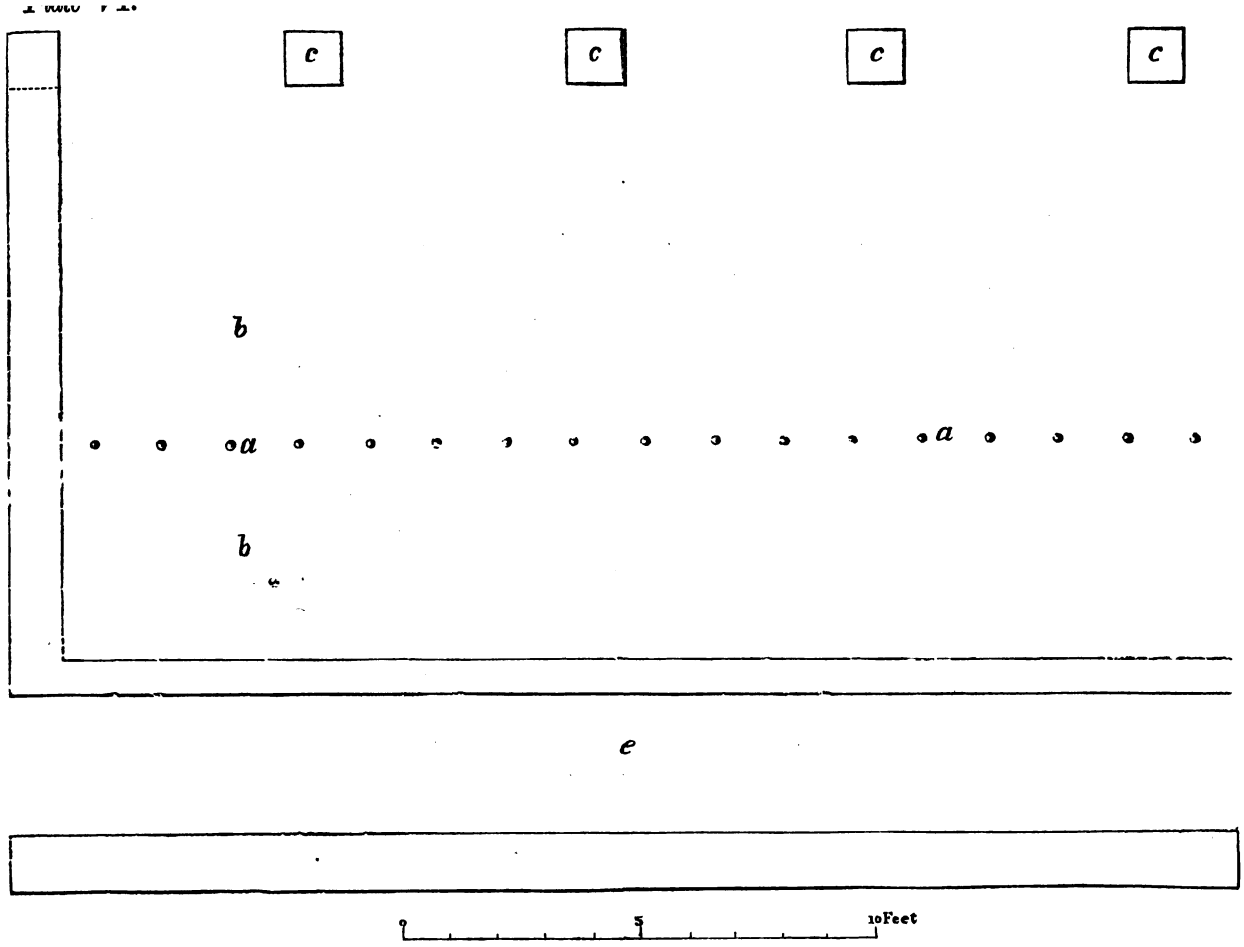
these troublesome insects should make their appearance, they may be greatly subdued by washing the interior walls of the vinery with a mixture of hot lime, and a sufficient quantity of sulphur to give a slight tinge of yellow to the mixture. In using the wash, be careful to avoid touching the hot pipes or flues with it, as the vapour arising therefrom is most injurious. The degree of heat should be continued, as before directed, until after the grapes have perfected their seeds, during which period the berries will remain almost stationary in size; but as soon as nature has performed this important office the growth will be most rapid. A slight increase of heat may now be given without fear of injury, provided the grapes are required at any given time. From the time they begin to change colour until they are thoroughly ripe, admit air freely, but, if the weather is cold, let it be given with due care and consideration. During the time of colouring a small portion of air should be admitted from the top of the house throughout the night still maintaining an internal temperature of not less than sixty degrees. After the grapes are well ripened, a greater portion of air must be given both by day and night; but the greatest care ought to be taken to keep the house as dry as possible, which will ensure a longer continuance of the crop in a state of perfection, as well as strengthen and invigorate the wood, and also will add greatly to the perfecting of the buds which are to be the main source of the crop for the following season. Every alternate lateral shoot should be cut off to within an inch of the principal bud, which can now be done with safety, and without fear of exciting the permanent buds. The remaining lateral shoots will be sufficient, at this stage of growth, to carry out the circulation of the sap, and, as the wood becomes more ripened and the leaves naturally decay, the remaining lateral shoots must be pruned; thus giving every assistance to the crop, as well as the bearing portion of wood for next year. It is the practice of some to pick off the leaves contiguous to the buds surrounding the

fruit, with the idea of admitting more sun and light; but I am confident the practice is not only detrimental to the fruit, but to the wood also, as it prevents that free circulation of sap which nature has ordered for the maturing of every bud so connected with the leaves; the latter, indeed, being part and parcel of the said buds, from which the fruit is to emanate the forthcoming season.

Grapes, in their growth, are subject to many enemies, in the shape of insects; neither are they exempt when they arrive at maturity. Wasps and flies are most destructive to them. The best guard against these troublesome insects is by covering the spaces where the lights are opened with perforated zinc or Haythorn's netting. Continue to give plenty of air; and the same system must be pursued in other respects, as previously directed, until the crop is all gathered, and the wood thoroughly ripe, when the vines must then have a season of rest. The border at this time must be attended to by giving it a good dressing, three or four inches thick, of equal quantities of well-rotted farmyard and sheep manure, taking the utmost care, when forking it in the border, not to break the roots; at the same time placing the fresh manure as near, or even amongst them, as is consistent with safety. Slightly cover it over with the forkings of the border, and in this state allow it to remain until the time arrives for forcing, when the directions previously given for covering with leaves, &c., must be resorted to.

Plate V.

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CHAPTER II.

CULTURE OF THE MUSCAT GRAPE.

Much anxiety and disappointment is often experienced in growing the Muscat Grape, and, in consequence of repeated failures, it is altogether discarded from many places where its presence would greatly enhance the value of the dessert; for, after all, there is no grape that will bear a competition with it when grown as it ought to be; but it is too frequently the case to see these grapes present a miserable appearance, the berries thinly set in the bunch, poorly swelled, and badly coloured. To avoid the latter evils, I will endeavour to state, as clearly as I can, the result of my practice, and which has been, in a great measure, attended with tolerable success.

The house, like all other vineries, as before stated, should occupy as high a situation in the garden as will ensure good drainage, free and pure air, and be at the same time sheltered from the north and east winds. From the plan of the house given, it will be observed that the vines are planted in the centre of the house, which I consider the only sure method whereby good fruit can be from year to year obtained. In certain situations, and favourable seasons, good Muscats may be had by planting the vines in the common way; but where doubt exists, and fruit in perfection is required, I can with confidence recommend the following directions;—We will

suppose a house entirely devoted to this peculiar grape. I begin with the vinery border, a portion of which is inside as well as outside of the house; the space occupied, therefore, from the back part of the border inside to the front part outside ought to be eighteen feet, and with a slope of two feet at least from the back to the front. In making the border, proceed with it in every particular the same as before recommended, taking every precaution to attend to the drainage. When the border is complete, and settled to its proper level, proceed to plant the vines in the centre of the border within the house, and train them up at the same distances as represented in the plan. Much good is derived from planting them thickly: it enables the grower to train every alternate vine up, and the other down, thereby entirely covering every inch of glass surface. Allowing each vine to carry ten or twelve bunches, you thereby secure a much greater weight of fruit than by any other plan, and at the same time each individual vine is not overcropped, which greatly assists them to properly ripen the allotted number in the greatest state of perfection; and the equal dispersion of fine bunches throughout the house gives a rich and luxuriant appearance. It may be argued that their being so thickly planted would, in a short time, produce confusion; but, by spurring or cutting them back every year to one eye, they preserve a neat, close, and compact appearance. The best proof I can offer is, that one house, under my own cultivation, which has received the above treatment, is now in as fine a state as possible; indeed, every year there is a decided improvement, both as regards the quantity and quality of the produce. I ought, perhaps, to have before observed, that, with a sufficient number of well-grown vines in pots, a house could be filled with a crop of excellent fruit the first year, without the slightest detriment to the forthcoming crops. I know some persons will sneer at such doctrine, but I only recommend to others what I have found to succeed well with myself. There can be but one opinion as to the

propriety of allowing the vines the first year to break or shoot forth as nature dictates, only assisting them at this stage with a moderate warmth, should the weather be unpropitious. The night temperature should not be allowed to range higher than fifty-five degrees, with an increase during the day of ten or fifteen degrees, from the commencement of their showing signs of vitality. Avoid upon all occasions a draught or current of cold air, which is most prejudicial; and greater injury is often done from this cause than may generally be supposed. At the same time, I strongly advocate a free admission of air, but which ought to be given upon principle, viz., allowing it to pass off from the top of the house, where the temperature is at all times the highest, consequently the impure portion of the air has the more need of escape at the point of collection. If any one will take the trouble to place himself immediately under the top lights, when the sun in the morning throws his cheering and powerful rays on the glass, he will at once perceive the necessity there is of admitting air at that point, and also of the care which ought to be taken in opening the lights by little at a time, particularly if the outward air is cold and piercing, for then even a small admission of the chilling blast is sensibly felt on the person. How much more must it be felt by the young and tender shoots! The evils arising from a glut or sudden rush of air being at once admitted are incalculable. When the sun is very powerful, with a cold nipping wind (which is often the case even in the months when we should expect a warm and balmy breeze), I would rather allow the internal atmosphere to rise ten degrees higher, than admit air from the front of the house in conjunction with the top, preferring to give all that is available from the upper part before resorting to other means. Many good crops of grapes are destroyed for the want of due care being given to proper and judicious ventilation: and this is often attributed to the border, the situation, or any other cause but the right one.

The treatment of the Muscat in pruning and thinning will

in no wise differ from that before recommended for the Hamburgh and others. It is the practice of many to keep a very high temperature for this most delicious grape, but such, in my opinion, is erroneous. A uniform and progressive heat, as the vine advances in growth, is certainly requisite, and during the period they are in bloom a somewhat closer atmosphere than was before required is essential. There is a peculiar delicacy, if I may so term it, in the formation of the seed-vessels of this grape, which renders it difficult to set, unless the temperature is well regulated, by keeping it pure, rather moist, and well ventilated; but by no means steam the house at any stage of their growth, more particularly now, as it only tends to increase that precarious weakness which they naturally undergo. Previously to, and during, the time they are in bloom, be careful to remove every superfluous lateral shoot, so as to admit as much light and air as possible. I do not mean to deprive them of more than is proper; but at this period the growth is generally most rapid and vigorous, and two days' inattention would very much encumber and darken the house. I by no means recommend the bunches to be exposed to the strong glare of the sun's rays, as they would receive great injury thereby; but it is highly beneficial that the permanent leaves, which protect the bunches, should be allowed full exposure. Another objection exists in allowing the lateral shoots to grow beyond their allotted space: much moisture is thereby detained, which not only acts prejudicially to the bunches, but also causes the leaves to be scorched, and hence arise red spider and disfiguration. As soon as the berries are set, lose no time in thinning. With this, as with other grapes, the sooner that operation is performed the better, which will cause the berries to be much finer. Throughout the whole period of their growth they must be supplied plentifully with tepid water at the roots, occasionally giving a thin decoction of sheep-manure water. Provided the border was made according to the directions before stated, water may

be given freely without fear of damage from stagnation; but few plants are more susceptible of injury from too damp and retentive a soil than the Muscat grape: hence, therefore, arises the necessity of strictly following out the instructions laid down with reference to the draining of the border.

Do not syringe the vines after the buds have advanced to the length of two inches, even should the red spider make its appearance, but from which, with due care, little damage need be apprehended. The same application may be resorted to with success as, in the case of other vineries, is recommended in the former chapter. From the time the grapes are in bloom until they are ripe, the temperature by night ought to be kept about sixty-five degrees, and by day from seventy-six to eighty or eighty-five degrees, but never let it attain the latter without admitting plenty of air. As soon as the grapes begin to change colour for ripening, the top lights must be a little way open by night, regulating the space according to the weather; at the same time maintaining the above internal temperature by the application of fire-heat, should it be needed. You will thus have a pure, sweet, and healthy climate, which will tend greatly to the swelling, colouring, and flavour of the berries. As the fruit progresses to perfection, the less water will they require at the roots; but do not allow the border to become too dry, which will always be the case when the ground is full of small cracks. When water is given to the inside border, be careful to give it on clear days, and at times when plenty of air can be given to the house, as it enables the vapour arising from watering to pass off without lodging on the foliage, which would be the case if done on a dull dark day, when but little air can be given.

Pursue the same uniform treatment until the grapes are thoroughly ripe, when less heat must be given, keeping the temperature at forty-five to fifty degrees, and as dry as possible. But to ensure a longer continuance of the fruit remaining in a perfect state, the following is the method I have adopted for

years, and with the most successful result:—Previous to the grapes beginning to shrivel, and when they have received all the nourishment they can obtain from the vine, cut the branch off, with the bunch attached, at the distance of one eye before the bunch, and immediately seal the end of the detached piece with sealing-wax. Tie the wood to a rod with the bunches suspended; each bunch to hang perfectly free, so as not to touch one another: for the convenience of carrying them, no more than two dozen bunches should be attached to one rod. When the whole are cut, sealed, and tied, convey them with the utmost care (choosing, of course, a fine day) to a dry room in a dwelling-house; the rods to be suspended from the ceiling, or supported on tressels, only taking care to allow a small space between each, just enough to prevent touching one another. If proper care be taken in occasionally looking them over to remove any decayed berry, they will remain in a perfect state for months. I generally cut those I wish to preserve about the middle or latter end of December; they continue good until the end of March (previous to which time the young crop is fit to cut). By allowing the fruit to remain on the vines after the leaves show signs of decay, it by no means improves, only tending to shrivel; and even in the best glazed and ventilated houses grapes are not exempt from damp, whereas, by removing the fruit from light, air, and moisture, they retain in a wonderful degree their size and flavour, which are objects worth attending to, enabling gardeners to exhibit excellent fruit every day throughout the dark months of winter. In thus removing the crop, the vines are greatly relieved; and it enables the grower to treat the vines in the most advantageous manner for their future bearing, which must be done by withdrawing all artificial heat, and admitting air freely, both by day and night.

The interior as well as the exterior border must now receive a good dressing of equal quantities of sheep-fold and well-rotted farmyard manure. Remove with care the surface-mould of the border to the depth of one or two inches, or as

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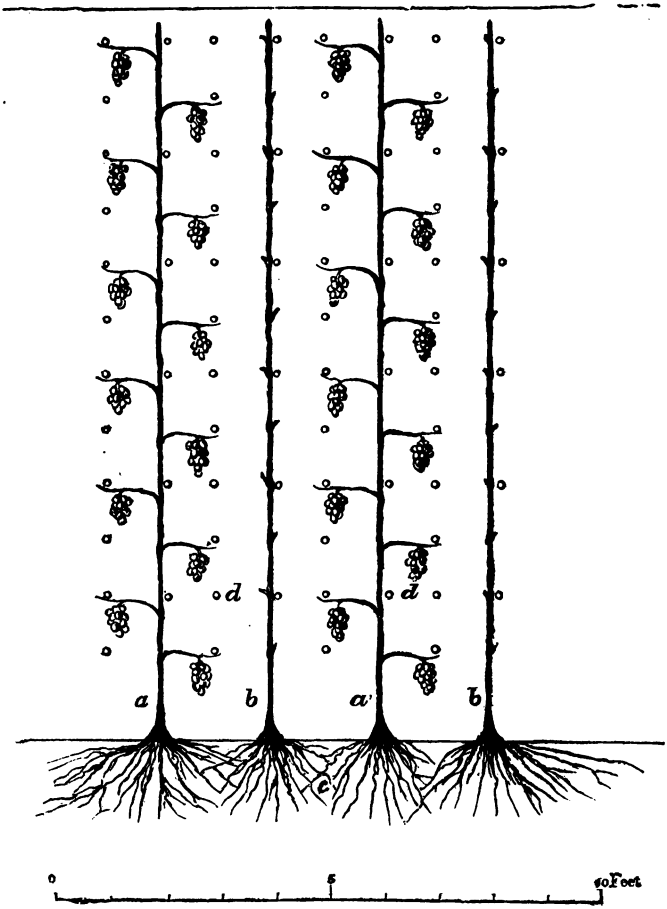
much as can be cleared off until the roots are visible, when a covering of the above mixture must be placed immediately on the roots to the depth of four or five inches. Water the inside border copiously over the manure; frequently repeat the watering throughout the winter and spring, in order to wash the strength of the manure amongst the roots. It will not be necessary to water the outside border, as sufficient moisture will be had from rain. The dressing of manure should be done at least a month before the vines are pruned, as by so doing it gives the vines the ability of shooting forth numerous young roots amongst the newly-laid-on manure, which is of immense importance to their well-doing the following season. The reason I recommend their not being pruned immediately after the crop is taken from them is, that, however well-matured the wood may be, and however many of the principal leaves may be in a state of decay, it will be observed that numerous small lateral shoots, at the extreme end, have still some vitality left; therefore those lateral shoots will keep up a sufficient circulation to enable the vine to throw out roots with greater facility, which, if once started, will continue to increase with rapidity, notwithstanding the branch is in a state of repose.

I will now say a few words relative to mildew, which has been of late the subject of much animadversion. I have read and heard much of it, but never felt the ill effect of it until the first week in August last. A fine crop of grapes, in a most luxuriant state, within the short space of twelve hours, was completely covered as with a shower of snow; fruit, leaves, and branches, being alike affected. When the disease attacks the vines thus suddenly, the remedy, of whatever kind, must be as promptly used. It is generally allowed that sulphur is almost the only cure; but much depends, even with that, on the method of its application. Whether mildew is produced by atmospheric or other causes is not at present my subject. To remedy the evil is the object. My practical experience is

as follows:—Mix sulphur with water to the consistency of paint, and take a brush, made from shreds of Russian matting, which is soft, and leaves more of the mixture on the vine than one of bristles; with the wash paint the whole of the wood, footstalks of the leaves, and the stem of the upper part of the bunch, all of which can be done by a careful person, without doing any injury to the fruit. At the same time wash the interior walls of the house with hot lime, mixed with an equal quantity of sulphur: keep the house for a few days rather close. The effect produced on the vines from this treatment was evident in a few hours; the mildew was completely checked, nay, cured, and the result was as fine a sample of beautifully-coloured and well-swelled fruit as could be wished for. The wood was also in excellent condition, and the foliage perfect to the last. As a further proof of the efficacy of this plan in making a perfect cure, I will instance a house of grapes, some in bloom, and others as large as peas, in the first week of November, 1850. These were attacked in the same manner with mildew, and treated precisely as the others, and with the same successful result. My opinion is that, in applying the sulphur to the wood as recommended, the strength of that powerful agent is imbibed into the pores, and it consequently acts on the whole plant to which it is applied, and enables it to repel the evil effects of the outward air. The washing of the walls also, in a great measure, purifies the internal atmosphere. It will at once be acknowledged how infinitely preferable this method of applying the sulphur is to the way in which, in many cases, I have seen it used, where the bunches were entirely covered with it, not only giving the fruit an unsightly appearance, but in reality making it unfit for table.

Plate VII.



CHAPTER III.

CULTURE OF THE VINE IN THE OPEN AIR.

THERE appears to me to be a great want of good management in the cultivation of the vine in the open air. This, I think, is much to be regretted, when we take into consideration the numerous eligible places where it might be grown to great advantage and profit to the cultivator; for instance, against farm-buildings and other such erections, which are for the most part quite bare. In some instances the soil will be found suitable to the growth of this fruit; but where such is not the case, a border of ten or twelve feet wide must be formed, adhering to the directions previously given in making the borders for the vineries. In order to prevent cattle getting to them, a paling could easily be put up at a trifling expense. When the border is made, proceed with the planting, selecting the following sorts:—Sweet Water, Muscadine, Esperion, and Black Cluster, all of which are well suited for the open air. In order to preserve a neat appearance, and also to prevent the necessity of disturbing by constant nailing the walls or boarding to which the vines are to be trained, I would recommend the use of galvanised nails, which can be purchased at a very reasonable price. Let the vines be arranged two feet apart, as represented in Plate VII., and at every other row of nails plant a vine, which ought to be done in the autumn,

should the border be ready then, but not later than the month of March, so as to enable them to strike out young fibres before the buds begin to swell. In pruning, leave only two buds at a foot-and-a-half from the ground: those under them should be cut off with a sharp knife, after they are grown to the length of a foot or so. Select the strongest, and remove the other. Train the young shoot to the nails, but be careful not to tie them too tight, which would impede the free circulation of the sap. When the shoot has reached to the top of the wall or building,—which it will very soon do, provided proper care and attention is taken to give water when the weather is dry, and occasionally to loosen the surface by lightly forking the portion of the border nearest to the stems, —you must cover the whole surface with a thin dressing of well-rotted manure to prevent too rapid evaporation, and also to screen the roots from the too powerful rays of the sun. Pinch the shoot off when it has attained the required height, and follow the directions previously given for the treatment of those vines planted in the vineries. It will, however, require some degree of care and attention in keeping the lateral shoots removed so as to admit the sun and air to the wood, in order to get it well ripened before the cold weather sets in, as much of the success depends on the wood and eyes being well matured. When this end is fully accomplished, prune off the stems of the lateral shoots nearly close to the eye from which they proceed. The vines will now be in a state of repose, and will therefore require nothing further beyond a good dressing of rotted manure being forked into the border. As the spring advances they will begin to bud forth, when care must be taken to select the strongest shoots, leaving them at regular distances, as shown in the sketch.

It would well repay the grower to take pains in thinning each bunch properly, only one of which must be left on each shoot; for, by pursuing this plan, a greater weight of fruit will be obtained, as well as a better quality, than if they were

left in a crowded state. The operation of thinning is not so formidable as it may at first appear. A very little practice will ensure complete success, particularly to those who take an interest in the well-doing of the crop: in warm and favourable situations, fruit little short in size and flavour to those grown under glass can thus be obtained. The chief enemies to be feared are the birds and wasps. Care, therefore, must be taken to guard against their ravages, by using netting, and also glass wasp-traps, which are very cheap, and require nothing but a little beer or sugared water. The same method may be successfully followed as I have recommended in the vineries, in cutting the grapes with a portion of the wood, and sealing the end with wax.

The operation of pruning may be performed at any time after the fruit is cleared off, and the wood well ripened and leafless; but it is not so well to defer it beyond the latter end of January, for this reason, that the wound made with the knife becomes well healed, and prevents bleeding in the spring; whereas, if left beyond that time, the vine is very often much weakened from the loss of sap, hence puny wood, yellow foliage, and an indifferent crop. In pruning, cut each shoot back to two eyes from the main stem, one of which only is to be left to produce fruit. The object in leaving two is to guard against accident, in case of one being injured previously to their budding forth.

The same system is to be pursued from year to year. The main stem will, of course, increase in size; but it will be many years before the spurs or side branches assume an unsightly appearance, or occupy much space, provided the "spur system" of pruning is carefully carried out: at the same time an excellent crop of fruit may be thus secured every season.

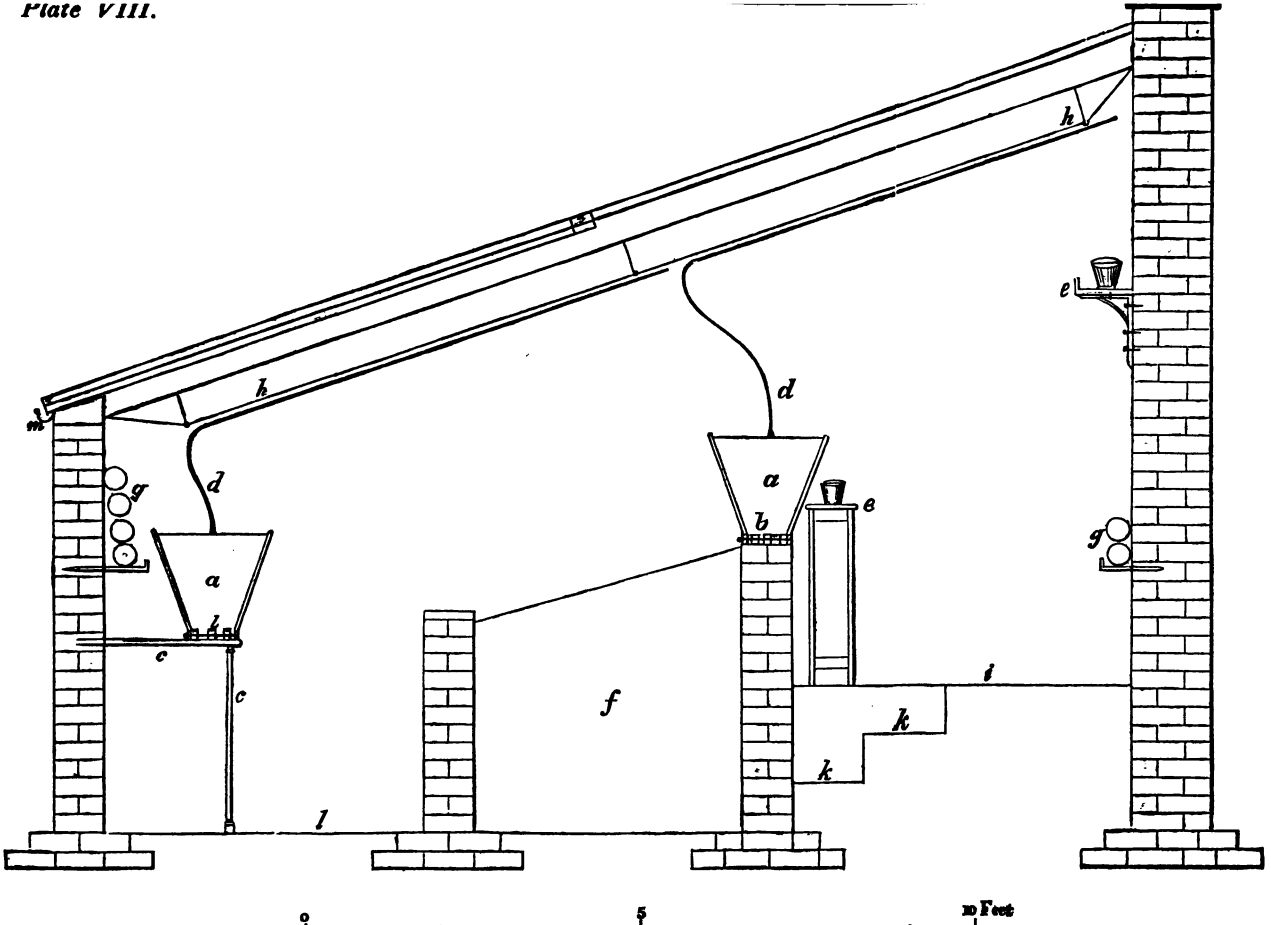
CHAPTER IV.

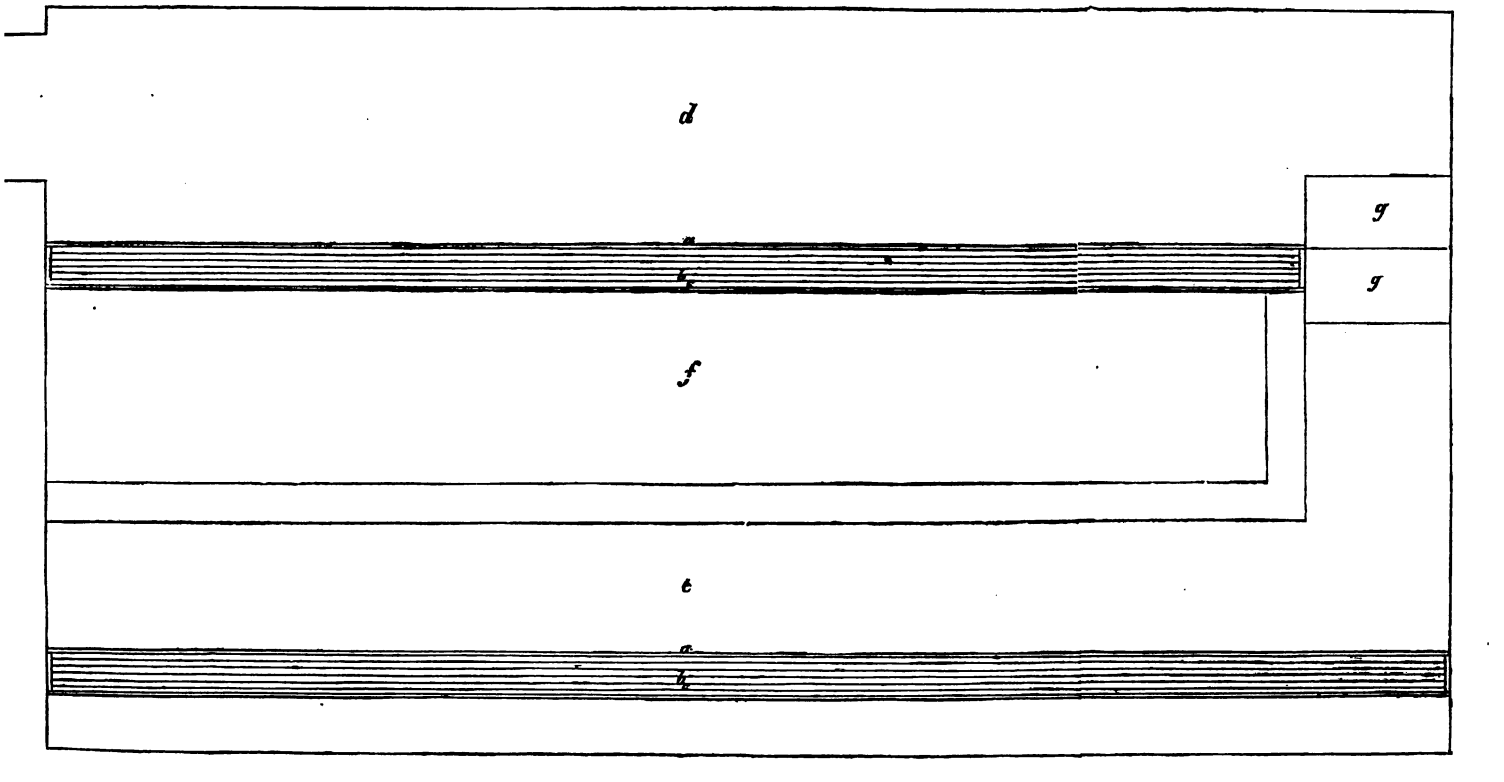
CULTURE OF THE VINE IN POTS.

In selecting the eyes, take none but well-matured ones, and those from the strongest and best ripened wood. Prepare them by cutting immediately under the bud, in a slanting direction, each way, as figured below, leaving three-fourths of

an inch of wood before and behind the eye. If the vines are required for early bearing the following season, the eyes should be put in before the middle of January; but if intended to be planted in vine borders or against walls, a later period in commencing will answer equally well. But in either case they should be treated as follows:—Prepare thirty-two or twenty-four sized pots. Put in them plenty of crocks for drainage, and over them pieces of light rough soil, up to within two inches of the top of the pot, one inch of which fill up with fine leaf and other mould, in equal proportions, adding to the mixture a little silver or other sharp sand. Place the eyes regularly on the surface, allowing a clear space

Plate VIII.

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between each, to ensure their easier removal when struck. Cover them over to the depth of half an inch with the same light compost as used immediately under them. Place the pot containing the eyes in a frame, pit, or other suitable structure, plunged into a bottom-heat of not less than eighty degrees, nor above ninety degrees, with a surface-heat of at least seventy degrees. They will soon emit roots, and the buds also will quickly make their appearance; and at this stage a little water will be highly beneficial. When they have grown to the height of two or three inches, pot them singly into sixty-sized pots, taking the utmost care when doing so not to injure them. In addition to loam, leaf-mould and sand, a little well decomposed stable-manure will tend much, even at this early stage of their growth, to strengthen and give vigour both to the roots and shoots. Place them again in a good bottom-heat, being careful to maintain a sweet and pure atmosphere; occasionally a little water will be necessary, but keep them rather dry than otherwise. As soon as the pots are filled with roots, repot them into thirty-two-sized ones, using at this potting a greater portion of decomposed manure, and so much the less of vegetable mould. Put them, when potted, into a vinery, or other convenient house, where a temperature of from seventy to eighty degrees is maintained. Place the pots on shelves, and as near the glass as practicable. The great object to be observed is to keep them in a free growing state, air being a most essential point, which ought to be admitted freely, but, of course, not depressing the internal heat below the previous given standard.

When these plants are fully furnished with roots, transplant them finally into a No. 8 size. For this potting use a compost as follows:—Let one half consist of the surface spit from old pasture, chopped into pieces of about two inches square. Let the other half be well-rotted farmyard manure, which, previous to being mixed with the mould, should be turned over frequently, adding to it a little quick-lime, to destroy

worms, &c. When properly mellowed by exposure to the sun and air, mix both together, adding a little sand, if the soil contains none. In crocking the pots, take care to place the pieces so as to allow the water to pass off freely, and place over them pieces of turf, to prevent the fine mould from getting amongst the crocks and clogging up the hollow spaces, it being most desirable they should be quite free for the escape of moisture, and for the admission of air to the roots; in potting, press the compost tolerably firm, previously taking care that it is sufficiently dry not to knead. As soon as potted, place them in the house, where they are to remain to complete their growth, training them under the glass, but not nearer to it than sixteen inches: the temperature should be increased from five to ten degrees, keeping a moist atmosphere. Use the syringe freely in the evenings, being careful to give air early in the mornings, to allow any excess of moisture to escape, in order to protect the tender foliage from being scorched by the rays of the sun.

When the vines have grown to the length of eight or twelve feet, it will be necessary to stop them, and if they are as healthy and strong as they ought to be, they will, immediately after being pinched off, throw out lateral shoots from the buds at the extreme ends: and as it is of great importance to prevent the other principal buds from breaking (I mean those upon which the crop is depending) for the following season, allow the top lateral to grow to the length of six or eight inches before pinching; but the lateral shoots, which are emitted from the base of the fruiting buds, you should stop beyond the first joint. Water freely at the roots, and occasionally with a decoction of manure from the sheep-fold. When the wood is thoroughly well matured and perfectly ripe, remove the potted plants from the house, placing them under a south wall until required for early forcing, or otherwise; protecting the roots with some light substance from the effects of frost, and secure the rods to the wall.

The following directions are alone applicable to the forcing of young vines raised from eyes, and treated in the manner previously described. The period at which the grapes are required to be ripe must be the guide as to the time of commencing forcing. Prune the vines as soon as they are leafless, by merely cutting them to the length required; when pruned, wash them with rain-water, using a little soft soap and sulphur, that has been previously boiled together, which would cleanse and otherwise benefit the wood and buds. The temperature for the first fortnight should range from fifty to fifty-five degrees, and gradually increase it to seventy degrees. Syringe freely with tepid water, and keep a genial moist atmosphere until the vines are broken, when less moisture will be required. From the constant humidity which has been kept up, and the frequent use of the syringe, only a little water at the roots will be required; but, if dry, give them sheep-manure water. In order to prevent the mould from becoming impure it will be necessary to secure a quick and free drainage, which would be greatly assisted by raising the pots on two separate pieces of wood or brickbats, placed under each edge; you will thus also have a more general circulation of heat round the pots. When the buds are regularly broken, and each shoot advanced to the length of six inches, prepare to plant the vines into a trough, as shown in the plan. The advantage to be derived is immense, by securing to them all the benefit of a border, independent of giving every root and branch an equal temperature, which is so essential to promote their perfection. First place upon the laths forming the bottom of the trough a layer of pieces of turf of about three inches square, to prevent the fine mould from being washed down; next put a layer of two or three inches deep of the following compost, viz., equal quantities of rich turfy loam and rotted manure from the farmyard, with the addition of a little sand. Proceed to remove the vines from the pots by turning the ball upside down on the palm of the hand, having

a convenient bench on which to rest the hand and ball whilst cautiously removing the crocks, and any objectionable soil, or worms, and taking the utmost care in so doing not to injure the roots. When so prepared, place the ball on the surface of the soil in the bottom of the trough. Proceed with another vine, and so on till the whole are done, leaving a space of about three inches between the ball of each to be filled up with the same compost as used under them. Cover the surface of the roots about one or two inches deep; the soil, previously to being put round the roots of the vines, must be warmed to the same temperature as the house. As soon as all are tied in their proper places, a good syringing will much assist them; but do not water at the roots for a few days, except it be absolutely necessary. If any water is given, let it be done by pouring it immediately on the balls.

Before a week has expired after removing the vines into the troughs, they will begin to show the benefit they are deriving from the change. When sufficiently advanced, stop each shoot one joint beyond the fruit, and leave only one bunch to each, and from eight to twelve to every vine, according to their strength. A heavier crop would deteriorate both from the size and colour of the berries. A plentiful supply of water will now be necessary, which can be given abundantly without fear of injury from stagnation; provided the directions given for the formation of the trough have been strictly attended to.

Much is gained by very early thinning, which must be carried out according to the instructions given in the previous chapters. The general treatment will require to be the same as described in Chapter I., with this exception, however, that the troughs will require almost a daily supply of water after the vines are fully established. When the fruit has arrived at maturity, and has all been cleared off, the vines may be removed with care, and placed against a wall, protecting the roots from

the sun, &c. They will produce a fair crop very early the following season, but certainly not equal to what they do the first year, either in quantity or quality, but whether they are intended for bearing or otherwise, the sooner they are taken out of the house after the crop is cut the better, that the succeeding young ones may be put in their places.

Before concluding this small treatise, I wish to add a few words in proof of the advantages I have myself derived from a house similar to the one figured in Plates VIII. and IX. I therefore can recommend it with confidence as being most useful for manifold purposes, not only where other vineries are employed, but also to the amateur and nurseryman. The centre part is admirably adapted for growing a stock of young vines for sale or otherwise; and it can also be used as a propagating bed for flowers or early vegetables, more particularly if a hot-water pipe were carried through the centre of it. But the most valuable use to which the house can be applied is the opportunity afforded of growing Muscat grapes in conjunction with others in troughs, and I am convinced that one trial would be sufficient to prove to the grower the immense advantage gained by transplanting the vines from the pots to mature their fruit. The trough system might justly be said to possess all the requisites of a vine border, viz., drained, heated, and covered with glass. With these advantages the grower is enabled to produce Muscats with as great success as any other kind, and by commencing forcing them in the beginning of December, ripe fruit of this much esteemed variety can be had by the first week in May. Another most material point is gained by producing the Muscat in the troughs. You are thus enabled to keep a constant supply of fruit for the table without forcing the permanently planted vines, which is an object of great importance, as it enables the gardener to give them a longer season of rest; and by so doing the vines will become stronger and better every year, and consequently the fruit will be of a superior quality, and

can be well ripened in time to succeed the early forced ones. In this way it is quite possible to have ripe Muscat grapes throughout the year, a desideratum which many have pronounced unattainable.

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